

Multiple Myeloma in Dogs

Dr. Nancy Kay, DVM, DACVIM

Nancy has more than 30 years of experience in the veterinary industry and is a board-certified veterinary specialist in internal medicine as well as a valued member of IDEXX's Pet Health Network team since 2014.

Multiple myeloma is a [cancerous](#) process that people and [dogs](#) have in common. This [disease](#) is also referred to as myeloma and plasma cell myeloma. Although not considered curable, this relatively uncommon canine disease can be successfully treated.

What is multiple myeloma?

- **Starting in lymphocytes**—Multiple myeloma cells originate from lymphocytes, a normal type of white blood cell that resides in the bone marrow.
- **Some Lymphocytes become plasma cells**—These lymphocytes differentiate into a variety of different types of cells, one of which is the plasma cell, an important component of the body's immune system.
- **Sometimes, there are too many plasma cells**—In cases of multiple myeloma, plasma cells developing within the bone marrow undergo a malignant transformation, and way too many plasma cells are manufactured.
- **This means less room for other cells**—This results in a "crowding out" of the normal bone marrow production of infection fighting white blood cells, oxygen carrying red blood cells and platelets (the cells responsible for controlling bleeding in the body). Myeloma patients often have dangerously low numbers of these normal cells within their bloodstream.
- **The malignant cells spread**—Once released from the bone marrow, the malignant plasma cells often spread to other sites. Their favorite place to set up housekeeping is within bones where the damage caused by the cancer cells can create significant pain for the patient.
- **Too many plasma cells lead to thick blood**—Plasma cells produce proteins called immunoglobulins that are the foot soldiers of the immune system. An overabundance of plasma cells, as is the case with multiple

myeloma, translates into an overabundance of immunoglobulin found in the bloodstream. This immunoglobulin alters the normal thickness of the [blood](#), transforming its normal water-like consistency to that of syrup. This change wreaks havoc within smaller blood vessels where the blood sludges and causes damage to the tissues. This is referred to as hyperviscosity syndrome and can be life threatening, particularly if the brain is affected.

Cause of multiple myeloma in dogs

[According to a study found on PubMed.gov](#), multiple myeloma in people has been associated with exposure to toxic chemicals present in tobacco smoke and emissions from petroleum refinery waste dumps and industrial operations.

The cause of multiple myeloma in companion animals is unknown, and there is no [breed](#) or sex predilection. Middle aged to older dogs and cats are most commonly affected.

Symptoms of multiple myeloma in dogs

The major symptoms associated with multiple myeloma are caused by the spread of cancer cells, hyperviscosity syndrome (thick blood), and too few normal cells within the bone marrow (see explanations above). Additionally, some dogs and cats with myeloma develop hypercalcemia, a higher than normal level of calcium in the bloodstream. This hypercalcemia can produce a number of serious consequences over time, the most significant of which is kidney failure.

Because multiple myeloma cells can wreak havoc in so many ways, the symptoms associated with this disease vary from patient to patient. **Most commonly reported symptoms include:**

- [Lethargy](#)
- Weakness
- [Loss of appetite](#)
- Lameness and/or bone pain (caused by the spread of cancer cells)
- Unexplained bleeding
- Loss of vision
- Abrupt onset of neurological symptoms or seizures
- Increased thirst and urine output

Multiple Myeloma in Dogs

Diagnosis of multiple myeloma in dogs

The diagnosis of multiple myeloma is made when two or more of the following criteria are satisfied:

- Radiographs ([x-rays](#)) document characteristic bony changes caused by the spread of myeloma
- Bone marrow analysis reveals an overabundance of plasma cells
- An overabundance of strictly one type of immunoglobulins are shown circulating within the bloodstream (normal blood contains several types)
- The patient's urine contains Bence-Jones proteins, a characteristic type of immunoglobulin (protein) produced by many dogs and cats with multiple myeloma

A battery of tests is typically performed to make the diagnosis as well as to evaluate the patient's overall health. In addition to a thorough physical examination, testing may include:

- A complete blood cell count, chemistry profile and urinalysis
- Full body radiographs
- Abdominal ultrasound
- Bone marrow collection and evaluation
- Protein electrophoresis (performed on blood sample)
- Screening for Bence-Jones proteins (performed on urine sample)

Treatment of multiple myeloma in dogs

The key to successful treatment of multiple myeloma is getting therapy started as soon as possible, so as to eliminate the excess plasma cells before they manage to cause a life-threatening problem such as a stroke, hemorrhage, infection or kidney failure. Your [veterinarian](#) may refer you to a [veterinarian who specializes in oncology or internal medicine](#). Such specialists have significantly more experience treating this relatively uncommon disease. Treatment may include:

- **Chemotherapy**—The mainstay of multiple myeloma treatment is chemotherapy. Chemotherapy refers to [medication](#) that is absorbed by the body as a whole; therefore, it fights cancer cells throughout the body. The most commonly used medications to treat myeloma are administered orally at home. Your veterinarian may suggest frequent [checkups](#).
- **Radiation therapy**—Multiple myeloma cells are quite sensitive to radiation therapy. This mode of treatment can be used to rapidly diminish the pain associated with the spread of the cancer to bony sites. Radiation therapy is considered palliative (providing comfort), but does not replace chemotherapy in terms of fighting the disease.
- **Biphosphonates**—These are drugs that can be used to help manage bone pain caused by myeloma. They may also be helpful in reducing hypercalcemia (excess calcium in the bloodstream).
- **Antibiotics**—Reduced production of white blood cells caused by myeloma makes [infection](#) more of a risk. Antibiotic therapy may play a critical role in preventing this serious myeloma complication.
- **Pain management**—The bone abnormalities associated with myeloma can be profoundly painful. Pain reduction medications could be necessary in such situations.

Prognosis of multiple myeloma in dogs

Although multiple myeloma is not considered a curable disease, it is one of the more treatable forms of cancer. Most dogs respond well to chemotherapy with restoration of a good quality of life. In one study of 60 dogs with myeloma, treated with melphalan and prednisone, 92% experienced remission (evidence of the cancer partially to completely resolving). Average survival time for these dogs was 540 days¹.

Questions to ask your veterinarian

- Which diagnostic tests confirm that my pet has multiple myeloma?
- What issues/secondary complications (infection,

Multiple Myeloma in Dogs

elevated calcium level, spread of the cancer, hyperviscosity syndrome) does my pet have?

- How soon can treatment begin?
- How can I schedule a consultation with a veterinary oncologist or internist?

If you have any questions or concerns, you should always visit or call your veterinarian -- they are your best resource to ensure the health and well-being of your pets.

Resources:

1. [Matus, RE, CE Leifer, EG MacEwen, and Al Hurvitz. "Result Filters." National Center for Biotechnology Information. U.S. National Library of Medicine, 1 June 1986. Web. 24 Apr. 2015.](#)